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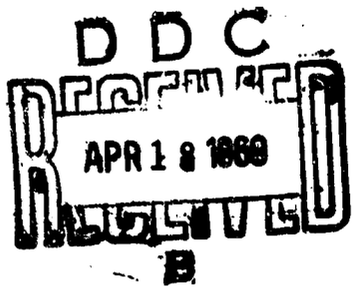

DEPARTMENT OF THE ARMY
Fort Detrick
Frederick, Maryland

Translation No. T-709-1

Author: Marie-Thérèse Fayet, Institut Francais de Virologie, 256, Rue Marcel Mérieux, Lyon, Rhône, France.

Title: Increase in the Infectious capacity of the ribonucleic acid of the aphthous fever virus by the addition of diethylaminoethyl-dextran. (Augmentation du pouvoir infectant de l'acide ribonucléique du virus de la fièvre aphtheuse par addition de diéthylaminoéthyl-dextran).

Journal: Proceedings of the Academy of Science, Paris (Compt. Rend. Acad. Sci.) 264: 783-784 (1967).

February 1969

SUMMARY

The infectious capacity of aphthous virus RNA preparations for pig kidney cells is increased by approximately two log units by the presence of diethylaminoethyl-dextran. ( )

Vaheri and Pagano (1)(2) have demonstrated that the additon of the polycation, diethylaminoethyl-dextran (DEAE-D), results in a 100-fold increase in the sensitivity of monkey kidney cells in primary cultures to polio virus ribonucleic acid (RNA). They employed the plaque method for estimating the infectious capacity of the RNA.

After extracting the RNA of the aphthous fever virus, we measured its infectivity and observed the cytopathogenic effects in primary tubes of pig kidney cells. We successfully utilized DEAE-D for increasing the sensitivity of these cells to infection with viral RNA.

MATERIAL AND METHODS

The aphthous viruses (O, Flander, 1947; A, Allier, 1960; or C, Vosges, 1960) were cultivated on bovine linqual epithelium using the technique of Frenkel or on BHK 21 cells.

The RNA was extracted from viral preparations through the use of cold phenol and in the presence of bentonite and 0.1 % sodium dodecylsulfate (SDS)(3).

The infectivity of viral RNA preparations was usually measured by the cytopathogenic effect (CPE) in primary culture tubes of hog kidney cells. The titer was expressed as the $CPED_{50}$/ml (dose required for a 50 % cytopathogenic effect) and was determined by inoculating six tubes with logarithmic dilutiongs at 0.6 or 1.0 intervals. The cell layer was rinsed with phosphate buffer (PBS) and

The reproducibility of the results was satisfactor. Of the 16 assays carried out over a period of three months, the variation in the titer of the same RNA preparation was limited quite well (3). A standard variance of 0.3 log units was obtained was compared to those obtained with the regular method.

REMARKS

1. If the infectivity of aphthous virus is titered under the same conditions as the viral RNA, the presence of DEAE-D does not increase the infectious capacity.

2. If viral RNA is diluted in LBH and not in PBS, the presence of DEAE-D does not increase the infectivity titer.

3. The presence of DEAE-D during the extraction of the viral RNA does not cause an improvement in the infectivity titer of the RNA extracted in this manner.

4. An analogous improvement in the viral RNA titer has been obtained in the presence of DEAE-D using the plaque technique.

Various hypotheses have been proposed for the mechanism of action of DEAE-D. It does not appear that the DEAE-D protects the RNA against ribonuclease. It is possible that it modifies the cell surface; this poly-cation is able to effect the negative charges of RNA and the cell surface. These assays actually measure this action.

REFERENCES

(1) A. Vaheri and J.S. Pagano, Virology, 27, No. 3, 1965, p. 434-436.

(2) J.S. Pagano and A. Vaheri, Archiv. Virusforschung, 17, Nos. 3-4, 1965, p. 456-464.

(3) M.F. Fayet and J. Vallée (to be published).